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(19) (CA) **CANADIAN PATENT** (12)

(54) SPACER BAR

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ABSTRACT OF THE DISCLOSURE

A spacer bar, suitable for use in a window, unit includes a further wall wrapped over an inner spacing wall between the panes of glass. The further wall is provided with upstanding tabs stamped or cut from the further wall for supporting muntin bars or parallel ridges to hold the edge of an extra pane of glass.

This invention relates to a multiple glazed unit and to a spacer bar for spacing apart the glass panes of such a unit.

In multiple glazed units two or more panes of glass are normally spaced one from another by marginal edge spacers and adhered thereto by a sealing composition applied between each pane and the spacer. The spacer is often a hollow vented profile section and may contain dessicant to avoid condensation between the sealed glass panes.

When the spacer is a profile section, e.g. a tube, it is frequently roll-formed or extruded. It may have a pair of side walls, an outer wall and an inner wall. The inner wall may define the greatest span between the side walls and the glass panes. The outer wall which lies flush with the edges of the glass panes may have a somewhat narrower span. Thus the side walls extending between the inner and outer walls do not define maximum span over their whole height. Sealing compound is located in whatever space is available between the glass panes and the side walls.

When more than two panes of glass are used in a multiple glazing unit it is quite common merely to abut a second spacer to one pane of a double glazed unit and provide another pane of glass to the free side of the second spacer.

When muntin bars are used between the panes for decorative or reinforcement purposes it has been a problem to fix them securely to the spacers so that there is no danger of them slipping out of position due, for example, to vibration.

It is therefore an object of the invention to provide an improved spacer for a multiple glazed unit.



According to the invention there is provided a spacer suitable for use in a window unit having at least first and second parallel and spaced-apart panes of glass, the spacer being a hollow tubular member positionable between the first 5 and second panes of glass and comprising:

a pair of side walls;
an outer wall interconnecting the inner walls; and
a pair of inner walls substantially parallel to said outer wall, one of said inner walls extending over the length 10 of the tubular member and the other of said inner walls being wrapped over said one inner wall and extending over the length of the tubular member and between the side walls.

The wrapped over other inner wall provides a support from which can be cut or stamped mounting means, for example, 15 upstanding tabs, indentations, ridges, bumps, or apertures. These mounting means may be used for mounting any desired material between the window panes, notably, a further glass pane or muntin bars. The tubular member may be made from metal, for example aluminum, or may be made from a thermo- 20 plastic material.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings of which:

Figure 1 is a perspective view of a part of a conventional spacer sandwiched between two glass panes;

Figure 2 is a perspective view of part of a spacer according to the invention;

Figure 3 is a perspective view of part of a spacer similar to that of Figure 2 having mounting means for muntin bars and a third glass pane;

Figure 4 is a perspective view of a part of a spacer similar to that of Figure 2 having some alternative mounting means to those shown in Figure 3;

glazed unit according to the invention;

Fig. 6 is a perspective view of part of another multiple glazed unit according to the invention;

5 Fig. 7 is a perspective view of part of another multiple glazed unit according to the invention illustrating a modified spacer bar according to the invention;

Fig. 8 is a perspective view of part of another multiple glazed unit according to the invention illustrating 10 another modified spacer bar according to the invention; and

Figs. 9, 10 and 11 show stages in one manner of production of the spacer bar of Fig. 8.

Fig. 1 of the drawings illustrates a conventional hollow vented spacer 11 comprising a roll formed metal tube 15 located between first and second glass panes 12 and 13 as in a conventional sealed unit. The inner wall 14 spans the gap between the glass panes 12, 13, and is formed as two interlocking parts with an air gap therebetween as shown.

The outer wall 15 has a span less than the inner wall. The 20 side walls each have two parallel portions 16, 17 joined through a shoulder 18. Near the outer margins of the glass panes 12, 13, spaces 19 are defined between the glass, side wall portions 16 and shoulder 19 for filling with sealing compound. ^{Desiccant} is usually placed within the hollow 25 interior of the spacer 11.

In the remaining figures illustrating the invention, the same reference numerals as those of Fig. 1 are used to designate similar parts. A spacer 20 is made by roll-forming longitudinally a longitudinal strip into the 30 shape illustrated as, for example, in Figs. 9, 10 and 11. The material from which the spacer is formed is conveniently metal, e.g. aluminum, or rigid thermoplastic, for example polycarbonate. The inner wall is formed by a first substantially flat portion 21 substantially spanning the

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desired gap between glass panes. A wrapped over second portion 22 lies over first portion 21.

If no muntin bars or extra panes of glass or any other item is to be located between the first and second glass panes located on each side of the spacer, then the 5 second wrapped over inner wall portion 22 of the spacer may be free from additional mounting means.

Inner wall portion 22 is advantageously provided, as seen in Figs. 3 and 6, with a pair of parallel ridges 23 10 running longitudinally along its length and projecting inwardly. The ridges 23 are spaced apart to accept the edge of a further pane of glass therebetween.

In Fig. 6, a third glass pane 26 is shown mounted between ridges 23. The ridges may be formed on the portion 15 22 before the strip is roll-formed into the form of the spacer 20 or afterwards, or as part of the spacer forming operation.

Inner wall portion 22 may be easily provided with mounting means for muntin bars or reinforcing bars or other 20 material it is desired to locate between the panes. Wrapped over portion 22 is available to simple cutting and tooling devices after formation of the strip into the spacer 20.

Tabs 24 may be cut or stamped from the portion 22 and bent 25 into an upstanding position to act as latches with the interior of ends of hollow muntin bars 25. Alternatively, a series of four tabs can be cut or stamped from portion 22 and bent to be upstanding therefrom and to form a box 27 to hold the end of a solid or hollow muntin or reinforcing bar. The tabs may be of any convenient shape and pattern.

30 Alternatively to stamping or cutting tabs from the portion 22, indentations or raised portions can be provided.

are assembled in conventional manner. Straight lengths of spacer 20 are assembled with corner members 28.

Figs. 7 and 8 show other instances of a third pane of glass 26 mounted between panes 12 and 13 using alternative embodiments of the inventive spacer bar. The spacer bar of Fig. 7 has, in place of ridges 23, a trough 40 which is formed in overlapping wall portion 22. Trough 40 receives the edge of third glass pane 26. Wall portion 22 has a portion 44 bent back underneath trough 40 providing some support for trough 40. In the spacer bar illustrated, still further support is provided by a leg 38 bent at right angles from inner wall portion 21 extending towards outer wall 15.

The spacer bar of Fig. 8 is similar to that of Fig. 7 in that it is provided with trough 40. However, in this case, wall portion 21 is similarly formed so that trough portions of wall portions 21, 22 coincide to form trough 40. Dessicant 42 fills the space within the spacer bar and has a drying effect on the region between panes 12, 13 through the crack between wall portions 21 and 22 and through the holes left by stamped out tabs 24. Although not shown, dessicant is normally used in the other spacer bars illustrated.

Other manners of mounting third sheet of glass 26 are within the scope of the invention. For example, two series of aligned tabs 24 may be used.

The third sheet of glass 26 is located in position during assembly. First and second panes of glass 12 and 13 are positioned one to each side of the spacer 20 and sealing compound 29 is compressed into spaces 19 and on the outer wall 15 of the spacer between glass panes 12 and 13.

The finally assembled unit can be mounted conventionally in a frame.

The spacer bar itself may be formed by techniques through the sequential stages shown in Figs. 9, 10 and 11. The metal sheet is first formed into the shape shown in Fig. 9. At this stage dessicant may be added. Then one leg is bent over and provided with trough part, if desired, as shown in Fig. 10. Finally the other leg is bent over and provided with a corresponding trough part as shown in Fig. 11. The two trough parts correspond to form trough 40. Other embodiments of the spacer bar may be formed in a similar manner.

Other embodiments of the invention will be readily apparent to a person skilled in the art, the scope of the invention being defined in the appended claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PRIVILEGE OR PROPERTY IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A spacer suitable for use in a window unit having at least first and second parallel and spaced-apart panes of glass, the spacer being a hollow tubular member positionable between comprising:
 - a pair of side walls;
 - an outer wall interconnecting the side walls; and
 - a pair of inner walls substantially parallel to said outer wall, one of said inner walls extending over the length of the tubular member and between the side walls, and the other of said inner walls wrapped over said inner wall extending over the length of the tubular member and between the side walls, said other inner wall including engaging means for mounting at least one muntin or reinforcing bar between said first and second panes of glass.
2. A spacer as claimed in claim 1 in which the outer wall is narrower than the pair of inner walls, the side walls thereby defining therebetween a span which widens inwardly.
3. A spacer as claimed in claim 2 in which each side wall comprises a first portion adjacent said pair of inner walls and a second portion adjoining said outer wall, said first and second portions being parallel to one another and adjoining one another through a shoulder.
4. A spacer as claimed in claim 1 including, as engaging means for at least one muntin or reinforcing bar, at least one tab upstanding from said other inner wall engageable with latch means on said bar.

5. A spacer as claimed in claim 1 including, as engaging means for at least one muntin or reinforcing bar, at least one stamped out part of said other inner wall.

6. A spacer as claimed in claim 1 including means for mounting at least one further glass pane between said first and second pane.

7. A spacer suitable for use in a window unit having at least first, second and third parallel and spaced-apart panes of glass, the spacer being a hollow tubular member positionable between the first and second panes of glass and comprising:

a pair of side walls;
an outer wall interconnecting said inner walls; and
a pair of inner walls substantially parallel to said outer wall, one of said inner walls extending over the length of the tubular member and between said side walls, and the other of said inner walls wrapped over said one inner wall extending over the length of the tubular member and between the side walls, said other inner wall including a receiving channel for receiving the edge of said third pane of glass and having a reversely bent extension providing support for said channel, and said other inner wall including engaging means for mounting at least one muntin or reinforcing bar between the first and second panes of glass.

8. A spacer according to claim 1 wherein said one inner wall has a substantially perpendicular extension engaging said outer wall to provide support for said channel.

9. A spacer as defined in claim 1 adapted to separate said first and second glass panes at marginal portions thereof.

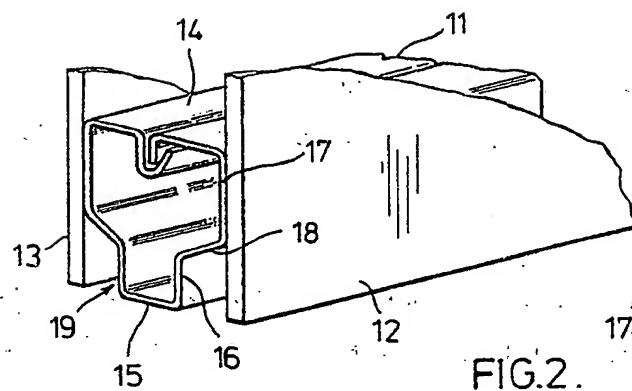


FIG.1.
PRIOR ART.

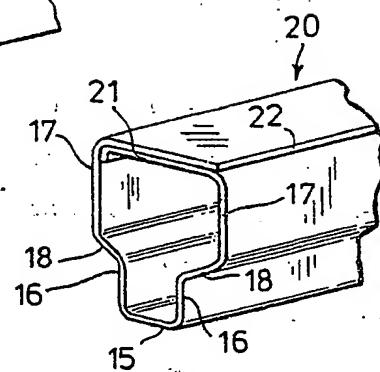


FIG.2.

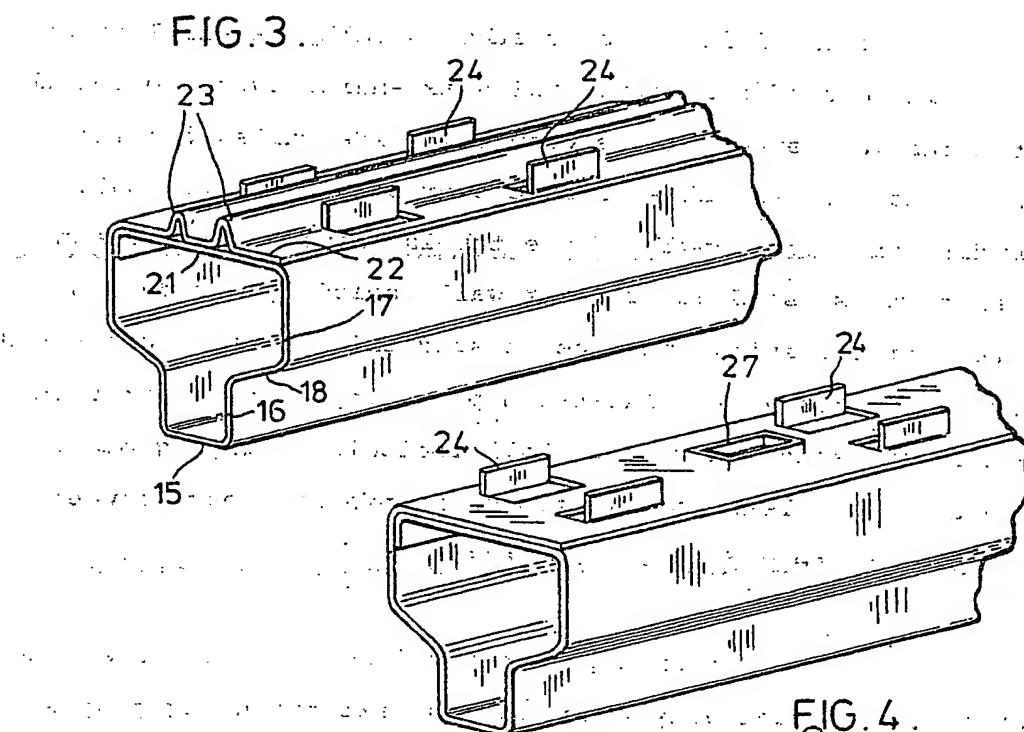


FIG.4.
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FIG. 5.

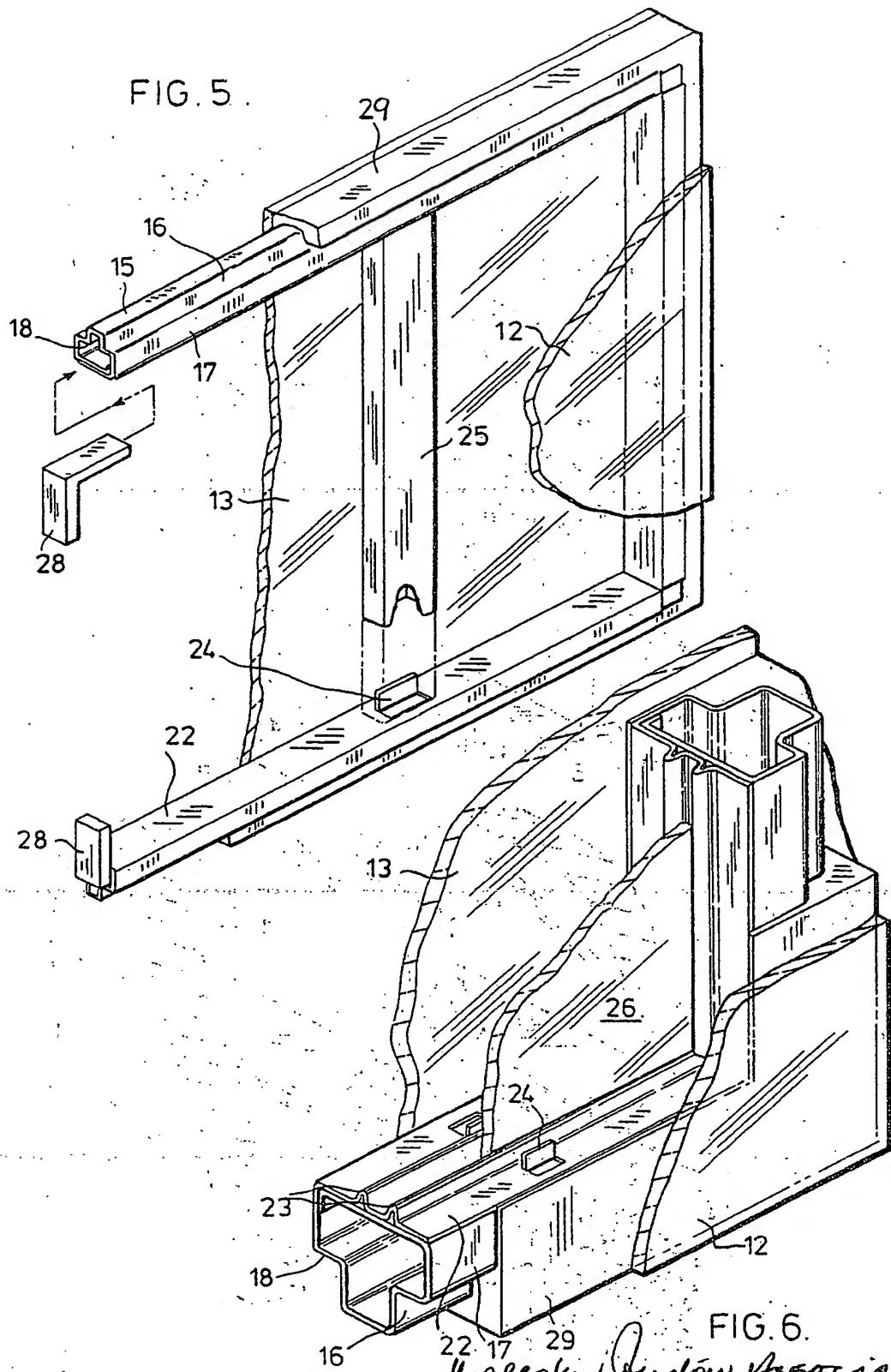


FIG. 6.

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FIG. 7.

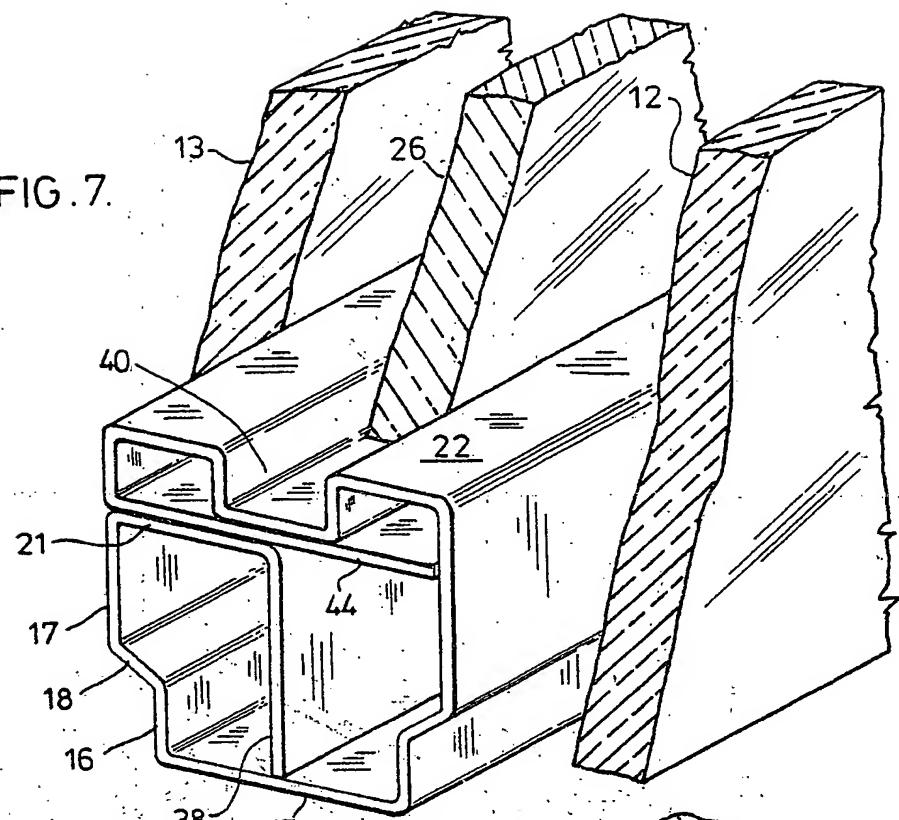
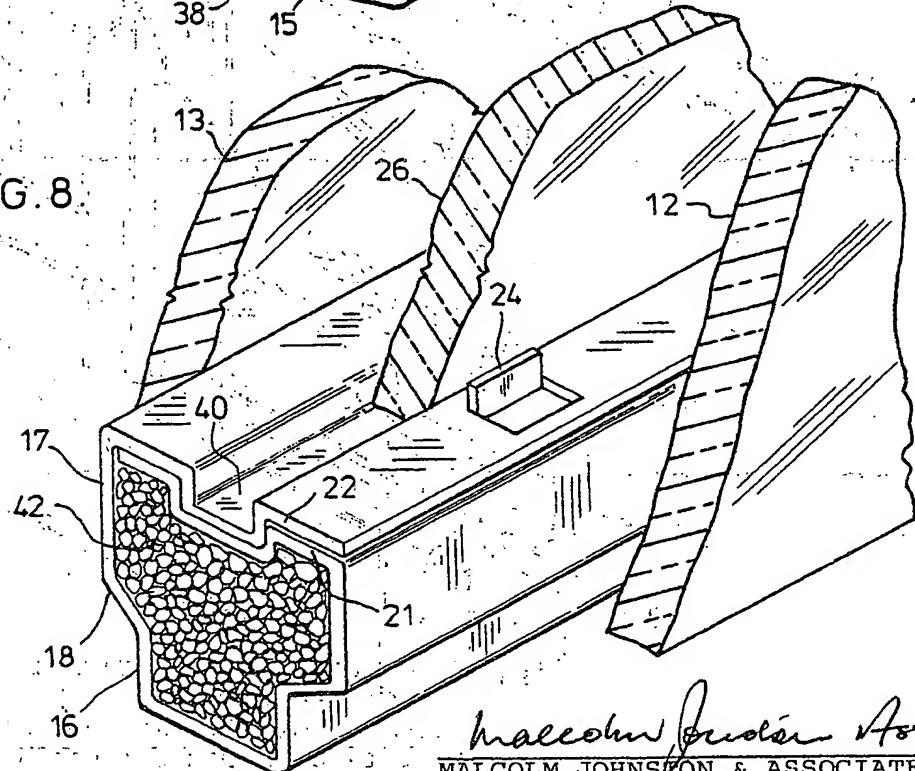


FIG. 8.



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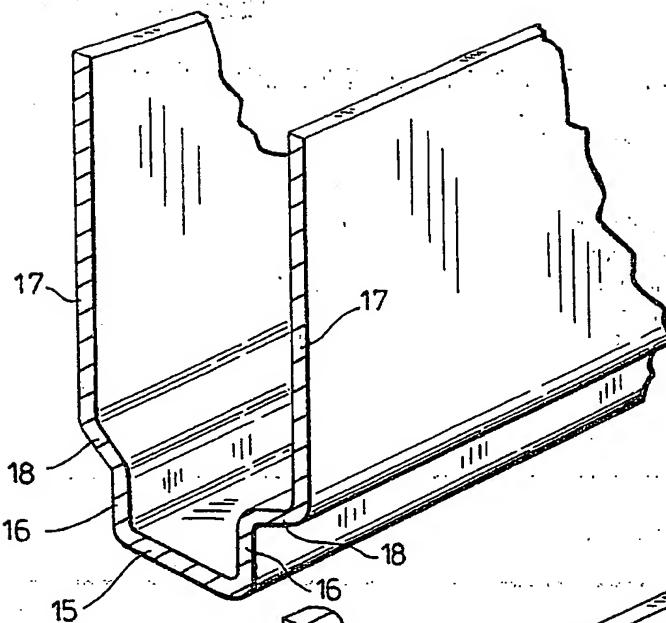


FIG. 9.

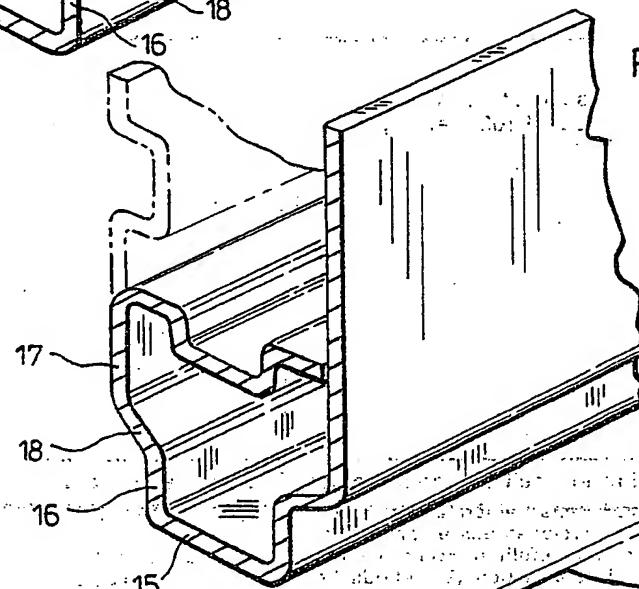


FIG. 10.

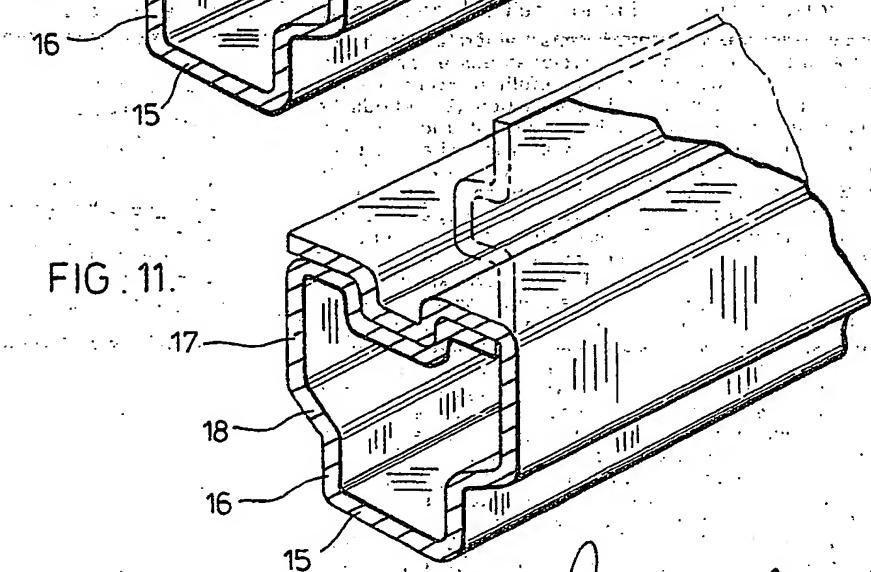


FIG. 11.

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